NEW YORK STATE DEPARTMENT OF TRANSPORTATION
OFFICE OF ENGINEERING

TECHNICAL SERVICES DIVISION

OPERATIONAL PLAN

SFY 1994-95 and Beyond

LIBRARY
N.Y.S. Dept. of Transportation
Engineering R&D Bureau
State Campus, Bldg. 7A/600
1220 Washington Avenue
Albany, NY 12232

Paul J. Mack, Director, Technical Services Division
Wesley P. Moody, Director, Soil Mechanics Bureau
Wayne J. Brule, Director, Materials Bureau
Robert J. Perry, Director, Engineering Research & Development Bureau

TECHNICAL SERVICES DIVISION

MISSION: To provide materials and geotechnical engineering and services and targeted engineering research in a timely and cost effective manner for the Department and other governmental agencies.

This is accomplished through:

- Development and recommendation of engineering policies, standards and specifications.

- Management of a quality assurance program for materials incorporated into Department projects.

- Conduct of specialized engineering studies requiring investigations, testing, analysis and recommendations.

The values we prize:

PEOPLE

TEAMWORK

EXCELLENCE

SERVICE

INTEGRITY

TECHNICAL SERVICES DIVISION
OPERATIONAL PLAN FOR SFY 1994-95 AND BEYOND

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NYSDOT
Library
50 Wolf Road, POD 34
Albany, New York 12232

TECHNICAL SERVICES DIVISION
OPERATIONAL PLAN FOR SFY 1994-95 AND BEYOND

I. PLAN OF ACTION

INTRODUCTION

The Operational Plan for Technical Services contains and describes the priorities, issues and goals for the program area for SFY 1994-95 and beyond. It is the result of an Operational Planning Process which invited input from our employees and the Regions. It culminated in a Division-level meeting held in early May.

The Technical Services program provides materials and geotechnical engineering services and targeted engineering research to the Department through the:

- development, recommendation and implementation of engineering policies, standards and specifications.

- management and operation of a materials quality assurance program.

- conduct of specialized studies requiring investigations, testing and analysis, utilizing both internal and external resources

These services are provided through the Materials, Soil Mechanics, and Engineering Research and Development Bureaus in the Main Office in conjunction with the Technical Services, Materials and Soils units in the Regions. The Technical Services program is founded on a multi-million dollar investment in laboratories and equipment in both the Central Office and the Regions and a dedicated, capable staff. There are approximately 300 employees in the Division and almost 300 in the Regional counterparts. In the Regions, the program receives its staffing through the Design and Construction program budgets.

The program serves all elements of the Department as well as some external clients because of the program units' expertise and facilities. The majority of services, now provided, directly support the capital program and this, along with research, are the most significant parts of the mission. The Department's expanded capital program over the next few years will present additional challenges as the workload strains the Division's ability to deliver technical services.

The Division has an extremely comprehensive and complex mission. In response, the workforce is very diverse. We are comprised of Chemists, Analysts, Technicians, Clerical workers, Machinists, Geologists, Computer Scientists, Researchers, Statisticians, Drillers, Administrators, Engineers and others. These skilled people use equally diverse equipment; from small precise pieces like microscopes, to our massive 600,000 pound capacity Universal Testing Machine. Also employed are state-of-the-art testing capabilities like Atomic Absorption, Gas Chromatography and the latest SHRP developed asphaltic binder equipment. Our four laboratories are accredited in 82 tests by the American Association of State Highway and Transportation Officials (AASHTO). Using our combined skills and equipment, we provide an astounding array of services. Some examples include, the chemical composition of many materials, physical properties of others, durability of aggregates and granular

materials, gradation of soils, prediction of the strength, stability and consolidation of sampled soils, load capacity of in-place piles, composition of steels, coating thicknesses, strength and durability of bridge bearings, concrete and asphalt mixtures and stability of rock slopes and many, many others.

Our 300 employees provide a direct and vital contribution to the Department's massive $1.5 billion capital construction program in addition to services to virtually all Department programs.

As part of our essential mission, the Division provides the management of a quality assurance program for all the materials incorporated into Department projects. We also engage in the direct production of contract plans for geotechnical elements and engineering analysis used as important input to contract plan development. In addition, we perform direct contract support functions and provide information, training, analysis and/or advice to Regional field Engineers engaged in either the design or construction of Capital and Maintenance projects. These activities can be characterized as production activities, and given the importance and the magnitude of these responsibilities, a major fraction of our resources is dedicated to these efforts. We also provide for high priority response to emergency situations resulting from natural causes. These programs must and will remain the Division's first priority. Our budgeting efforts have and will be prepared with this priority in mind since they cannot be provided without appropriate personal and non-personal resources.

Our second essential mission is to provide for development and continuous improvement of many of the Department's products and processes. This we accomplish through independent or participatory engagement in the development and recommendation of engineering policies, standards and specifications; the provision of a Departmental consultation program, and the conduct of both internal and external study and research requiring investigations, testing, analysis and recommendations.

In summary, it can be stated that the services provided by the Division are of vital importance to the success of both current and future NYSDOT programs.

RECENT ACHIEVEMENTS

The Division takes justifiable pride in its accomplishments; both in terms of its production and continuous improvement achievements.

A sampling of the production activities follows:

Number	Activity
2,083	NYSDOT employees trained by Materials Bureau
1,629	NYSDOT employees trained by the Soil Mechanics Bureau
4,475	Transactions by Research Library
36,239	Materials samples tested
4,211	Soil Sample Identification Tests
157	Bridge Foundation Designs
429	Evaluations of Materials Plants & Facilities
268	Soil Consolidation Tests
436	Geologic Survey & Analysis of Rock Cut Slopes
646	General Roadway Inspections
47	Revisions to Geotechnical Specification & Standards
90	Research Proposals received and rated
121	Materials QA procedures developed/revised
83,129	Materials tests completed
19	Research Publications produced
1,044	Geosynthetic tests completed
2,772	Granular Materials Soils tests
42	Roadway Foundation designs
1	Earth Dam Design
504	Requests of Research Bureau published reports

A sampling of our continuous improvement activities follows:

NEW YORK STATE THICKNESS DESIGN MANUAL FOR NEW AND RECONSTRUCTED PAVEMENTS

The Technical Services Division took the lead in developing New York State's Thickness Design Manual for New and Reconstructed Pavements which became policy on October 14, 1993. The new pavement design policy is predicated on building modern, more durable pavement sections capable of withstanding traffic loadings for longer time periods. These pavements, subjected to high truck volumes, will be thicker than those built to previous standards and include superior pavement subsurface drainage. The overall rationale is to gain long-term improved performance with reduced maintenance while achieving long-term economic benefits through favorable life-cycle costs.

CONTRACT RESEARCH PROGRAM

In 1993, the Department initiated a $500,000 per year program of contract research to be carried out by consultants, universities, and national laboratories. The program is being administered by the Engineering Research and Development Bureau. Projects to be financed by this program are

selected by an Oversight Panel composed of 12 executive managers representing a wide range of Departmental program areas. Technical Services Division Director serves as the panel's Chair.

The first round of the Contract Research Program resulted in the identification of 96 potential projects. The panel subsequently selected eight projects for solicitation of proposals. The evaluation of the proposals has been completed, and the following four projects have been approved for contract execution:

1. Improving Safety for Snow Plow Operators in Conditions of Reduced Visibility
2. Review and Development of Life-Cycle-Cost and Network Analysis Procedures for NYSDOT Highway Pavements
3. Effective Marketing of Transit Systems and High Occupancy Vehicles: Case Study Syracuse Metropolitan Area
4. Cost-Effectiveness of Consolidating Government Highway Services.

QC/QA PROCEDURES FOR HOT MIX ASPHALT AND PORTLAND CEMENT CONCRETE

Materials Bureau engineers continued to work with representative industry task forces to develop QC/QA specifications and procedures for hot mix asphalt and Portland cement concrete. Three pilot contracts were let utilizing QC/QA requirements, without statistics or pay factors, for hot mix asphalt plant inspection and another changed by order-on-contract. Three of the four projects were constructed in 1993. Information from the three projects was used to develop the next generation of QC/QA specifications for the 1994 season. The 1994 hot mix asphalt pilot projects will include statistics to determine acceptance of the mixture. Pay factors will be added in future generations of the specification. Concurrently, a training course curriculum was developed and the first dozen asphalt testing technicians composed of industry and Department people were trained and certified in a pilot course at Alfred State University. Specifications for Portland cement concrete plant inspection and procedures were completed for four initial pilot projects to be constructed in 1994.

DYNAMIC PILE TESTING - SUFFERN INTERCHANGE AND OAK POINT LINK

The Soil Mechanics Bureau completed a considerable amount of dynamic pile testing on the Suffern Interchange Project to support the State's investigation of alleged fraudulent activities concerning pile lengths and splices. In very tight time constraints, the Bureau organized and trained an elite testing team which performed and interpreted an unprecedented 200 dynamic pile test in less than 3 months. We determined pile capacities, lengths and weld locations of suspect driven piles for the State's investigations. This information was very instrumental in obtaining criminal convictions.

The efforts by all 10 team members, were recognized with Recognition of Employee Excellence Program (REEP) Awards.

The Bureau also performed a considerable amount of pile tests on the Oak Point Link Project to confirm the required ultimate static pile resistance for 36 inch diameter cylindrical steel piles. We organized several three-person testing teams that were on call to respond to testing needs within 24 hours of notification for the duration of the project.

Our timely results confirmed that required ultimate static pile capacities were reached when project refusal criteria were not achieved at the ordered lengths of the piles. This timely response resulted in the elimination of costly and time consuming pile splices as well as the cost of driving additional pile lengths.

Our testers have been praised for their technical skills and timely decisions many times by project personnel.

ROCK SLOPE HAZARD RATING PROCEDURE

Following World War II, a major highway construction program resulted in the construction of many deep rock cuts and highway miles built along high natural rock slopes. The variety of rock and mineral types along with weathering and deterioration over time has resulted in a variable yet steady deterioration of the slopes. In addition, old blasting techniques, prior to the advent of pre-splitting, created blasting damage that added to the long-term hazard problem. The design life of many of these slopes has been exceeded or is rapidly approaching. Recent experience shows that concern over safety is well founded.

An inspection and evaluation program was needed to determine which slopes required remediation and what priority should be assigned to each slope. The "Rock Slope Hazard Rating Procedure" was developed and issued in May of 1993 to provide uniformity in the inspection and rating process as applied by the Engineering Geologists of the Soil Mechanics Bureau. The procedure, which uses the three factors of geology, cross section and human exposure, provides a relative risk value to assist in budgeting for future remediation.

SHRP ASPHALT BINDER (SUPERPAVE IMPLEMENTATION)

The Materials Bureau Chemistry Laboratory received most of the SHRP binder test equipment through the FHWA Pooled Fund Purchase to test performance grade asphalt cements. The dynamic shear rheometer, the most critical piece, remains on order and is due for delivery in June 1994. Plans were developed to install the equipment in the laboratory and technicians were trained to use it. The Bureau continued participation in the Northeast States Asphalt Users/Producers Group to coordinate a uniform and orderly implementation of the new performance grade specifications in the NASTO region. Arrangements were initiated to use performance grade binder specifications in two pilot projects located in the Adirondack area to address the pavement cold temperature cracking problem.

IMPLEMENTATION OF SHRP RESEARCH PROJECTS

The Strategic Highway Research Program (SHRP) was a five year, federally funded research program which targeted four high payoff areas - asphalt, concrete and structures, highway operations, and long-term pavement performance. This research has concluded, and the states now have the responsibility for evaluating the 135 products which emerged from the program. The Department responded to the challenge by establishing an implementation committee comprised of a cross section of potential end users. The Engineering Research and Development Bureau developed the implementation plan and reporting documents being used by the committee, and will provide the membership with the follow-up assistance necessary to assure the successful implementation of all appropriate products.

NEW TOTAL AUTOMATION OF CONSOLIDATION TEST

The Soil Mechanics Bureau (SMB) has completely upgraded and enhanced the TACT (Total Automation of the Consolidation Test), hardware and software package. This is a set of 50+ user friendly menu-driven computer programs that have been highly customized to the needs of the SMB Design sections and the Soil Mechanics Laboratory with respect to on-line test reviews, manipulations, summary displays and printouts. The information from these tests are used to estimate magnitudes and time rates of settlement of soft foundation soils due to superimposed embankment and structure loads. The new system can display status information and data plots on any or all of the 10 TACT stations on the fly, and also on any completed test kept in the database. This has resulted in considerable time savings in Laboratory test reviews and interpretation of test data by Designers.

LEAD BASED PAINT REMOVAL/CONTAINMENT FROM BRIDGES

Materials Bureau engineers developed specification requirements for the safe removal of lead based paint from State steel bridges. The removal techniques range from hand held vacuum abrasive blasters for small areas to building enclosures to contain spent blasting abrasive and paint chips for large areas. The enclosed areas are connected to dust collection units to prevent the escape of lead containment dust. The specifications permit the contractor to use steel shot blasting materials that can be reused twenty to thirty times before it requires disposal. The reuse of blasting abrasive reduces the amount of material requiring disposal at hazardous land fill sites proportionately. The Departments of Health and Environmental Conservation endorsed the specifications for use by other agencies.

ISOTROPICALLY REINFORCED BRIDGE DECKS

The Engineering Research and Development Bureau completed a study of long-term performance of an alternative bridge deck design commonly known as the isotropic deck. It uses less steel than the current AASHTO guidelines. Some advantages of this design are: (1) easier construction of mats; (2) less steel, and (3) deeper concrete cover. This concept has been incorporated into the new Load and Resistance Factor Design Specifications of AASHTO.

DAMAGE FACTORS (ROAD WORK PHASE II)

The Engineering Research and Development Bureau provided technical assistance on "Road Work Phase II" for the Planning Division. Damage produced by various truck weights and axle configurations on NYS pavements were quantified. Findings of this study are being used to establish new permit and fine rates based on the actual damage the vehicles induce to pavements.

RUT AVOIDANCE (RA) HOT MIX ASPHALT MIXTURES

Materials Bureau engineers implemented statewide use of hot mix asphalt mixtures that resist rutting during hot summer weather. The design criteria provides for direct contact between the large size aggregate particles in the mixture and this aggregate framework carries the load from the vehicle tires. A consequence of this design is a mixture that has a lower asphalt content and thereby more difficult to compact. Experiments were carried out on several projects to evaluate pavement compaction roller patterns and the ability to control density of the pavement using nuclear gauges. Specifications were developed to incorporate the findings from the experiments.

CORROSION OF STEEL PILING

The Soil Mechanics Bureau forwarded a research proposal (Problem No. 95-D-51) on the Corrosion of Steel Piling to NCHRP. Through the active support of Dr. Perry, this proposal was ultimately approved and will be funded by the AASHTO Standing Committee on Research and will be funded at $300,000. This research will be focused on developing non-destructive investigative techniques to evaluate the condition of existing steel piles and their remaining useful life, particularly in situations where they will be relied on to carry rehabilitated or reconstructed structures for extended periods of time.

REVISION OF "PROCEDURE FOR THE CONTROL OF GRANULAR MATERIALS"

Recently, the Soil Mechanics Bureau issued SCP-13 "Procedure For the Control of Granular Materials" by way of Engineering Bulletin EB 94-006. This manual is effective with the letting of July 7, 1994, and it supersedes SCP-8 which has been in effect since 1985.

The latest edition provides statewide controls and documentation procedures for approving and rejecting recycled Portland cement concrete used for construction items. Metric units are used throughout the manual.

The updated manual is the culmination of many comments, discussions, and meeting with members of the Empire State Concrete and Aggregate Producers Association (ESCAPA), the Associated General Contractors (AGC), and the Recycled Aggregate Producers Association (RAPA). The benefits of this cooperative effort between industry and the DOT are a more clearly written manual, a mutual understanding of the problems and goals of the represented groups, and reinforcement of the common goal to have high quality transportation facilities constructed with quality granular materials.

ISTEA UTILIZATION REQUIREMENTS FOR SCRAP RUBBER TIRE IN HOT ASPHALT SPRAY APPLICATIONS

The Intermodal Surface Transportation Efficiency Act (ISTEA) requires use of rubber from scrap tires in hot mix asphalt applications, paid for in full or in part with Federal funds, beginning in the 1994 Federal fiscal year. The Congress placed a moratorium on the implementation for the first year that would have required 5 percent of the hot mix asphalt tonnage. In order to prepare for the ISTEA requirement, the Department constructed a pilot project in 1993 on Route 32 in southern Albany County. The pilot included both "dry" and "wet" processes for introducing rubber into the mixture. Pavement constructed with the "dry" process had some performance problems during paving and soon afterwards. The "wet" process worked well technically. Both processes created fumes at the plant and at the paving site that irritated workers. However, tests on samples collected from personal monitors on workers did not exceed the limits for the various compounds evaluated.

Arrangements were made to construct five additional projects in 1994, during the moratorium, utilizing 5.4 million pounds of rubber to gather more data and experience on the use of rubber. One project requiring glass as a substitute for approximately 5 percent of the fine aggregate in the hot mix asphalt was let for construction in 1994. An Engineering Instruction was completed to allocate rubber quantities to each region in proportion to the amount of hot mix asphalt estimated to be produced for the 1995 Federal fiscal year.

PEN COMPUTERS FIND APPLICATIONS IN NYSDOT

The Engineering Research and Development Bureau developed two data-collection systems using pen computers. Weighing only a few pounds, these devices basically replace clipboards -- instead of pencil and paper, users write with an electronic pen on a computer screen, roughly the size of a standard sheet of paper. The computers are intended for field workers who have not previously used computers and/or for whom laptops are too impractical or bulky. They allow users to enter data on electronic "forms" by hand while on-site in the field. The forms used were designed to be simple and intuitive, with the user tapping on boxes to make selections, but they may also be adapted to accept handwriting that is then converted to computer input. The data collected is automatically organized in databases, and various summary reports may be generated while still in the field. Later, the databases may be downloaded in the office to conventional personal computers. This process eliminates the need to enter data into the computer at the office after its collection, and also avoids transcribing errors and problems with illegible writing.

One of the two new information systems was prepared for the Materials Bureau to collect and organize data on distress of rigid, flexible, and flexible-over-rigid pavements. It has been tested in pilot studies in Regions 1, 3, and 8, and also demonstrated at a statewide Regional Materials Engineering meeting in December 1993, where it was well received.

The other system was developed at the request of the Highway Maintenance Division. Two forms were created for data collection in FHWA Test and Evaluation Project 28 ("Anti-Icing Technology"). This system has also been presented successfully in a two-day training session for regional personnel, and was used in Region 4 during snow-and-ice control operations.

ENGINEERING RESEARCH AND DEVELOPMENT BUREAU LIBRARY

Over the past few years, because of increasing demand from both Central Office and Regional program areas, the Engineering Research and Development Bureau has acquired a wider variety of reference materials to meet the Department's organizational needs. To improve customer service in providing materials and performing literature searches in a more efficient manner, the Bureau installed a computerized system to catalog and track reference materials.

In addition, this software has broadened our on-line database access to over 3000 systems, thereby increasing the pool of information available.

DEVELOPMENT OF APPROVAL PROCESS FOR PROPRIETARY RETAINING WALL SYSTEMS

The Soil Mechanics Bureau is in the process of standardizing the procedure for reviewing, pre-approving and specifying proprietary retaining wall systems for NYSDOT projects. All proprietary retaining wall systems must eventually be included on an Approved List of Products to be considered acceptable for use. Designers will use established guidelines, Standard Sheets and Special Specifications to assist them in selecting and displaying a proprietary wall category or system. Contractors will choose a proprietary wall system from the established category or system for construction.

The Soil Mechanics Bureau, in conjunction with the FHWA, is organizing a conference on proprietary retaining wall systems to be attended by States in FHWA Region 1. The main focus

of this conference is to share the Federal and each State's experience with proprietary retaining wall systems so that there is a better understanding of how these systems are designed and when and where they are to be used.

RECYCLED MATERIALS

1. Recycled Concrete Aggregate (RCA)

During Fiscal Year 1993-94, there were 61 stockpiles containing 100,650 cubic yards of material which were produced by 13 suppliers. The material which was utilized for subbase on NYSDOT projects in Regions 10 and 11 was sampled and tested by NYSDOT Main Office and/or Regional Soils Sections.

Since the beginning of the use of RCA (approximately 10 years ago), the Soil Mechanics Bureau (SMB) had the sole responsibility of sampling and testing this material. It was set up in this manner due to the possibility of the RCA containing contaminated construction and demolition material. Also, a uniform procedure for handling this material could be developed. Regional personnel were always present when any sampling took place.

Due to the increased use of RCA, it became evident that the Regional Soils personnel would eventually have to take over the sampling and testing of this material once they became knowledgeable in observing what an acceptable material should be.

We began transferring quality control of RCA to Regional Soils personnel, from both Regions 10 and 11 where both Regions performed sampling and Region 10 performed testing for both Regions on several RCA stockpiles. This was part of a phase-in for them to eventually take over these tasks. Both Regions presently call the Soil Mechanics Bureau (SMB) each time a stockpile is ready to be sampled. It is then determined whether the Region will sample or if SMB personnel will be present to observe the source, sampling and to bring back sample(s) for testing in Albany. The Region then samples and tests, usually under Case B of the SCP 13 Manual in which case the Central Office still gets one composite sample for monitoring purposes.

2. Recycled Asphalt Pavement (Shoulder Recycling)

I-88 between Bainbridge and Sidney, was originally constructed in the early 1970's and consisted of concrete pavement and stabilized gravel shoulders with a 1 inch hot mix top. The project included repairing the concrete pavement where necessary and recycling the outside as well as median shoulders.

Recycling operations lasted approximately one month. SMB personnel were in attendance for the majority of the time, assisting with the calibration, mixing and placement operations.

3. Kiln-Fired Ceramic Catalytic Connectors

Testing of Catalytic Converter cores from Corning Glass Company was performed for possible use as granular material. After testing and evaluating this material, a

memorandum was sent to Region 6 Soils stating that this material could be used for embankment material only. The material was used on the Corning By-Pass, Phase I project, in limited quantity.

4. Ceramic Insulators Blended With Crushed Stone

Inspection and sampling of a possible source of granular material consisting of a blend of Ceramic Insulators and Crushed Stone from Genesee LeRoy Stone Company. Physical and chemical testing was performed and analyzed. The test results were favorable which led to an approval being granted for its use as Item 304-Subbase.

5. Recycled Container Glass (RCG) And The Tire Chip Specifications

The Soil Mechanics Bureau has investigated the engineering properties of recycled container glass (RCG) and tire chips for possible use on highway construction projects.

Products of this investigation include:

1. An information file on RCG and tire chips for use in earthwork construction.

2. A draft Engineering Instruction for Sections 203 and 304 of our Standard Specifications allowing the use of RCG in embankment and subbase construction. A final EI will be submitted after clearance through Departmental reviews.

3. A draft special specification for the use of tire chips as a lightweight fill material. A final specification will ensue after clearance through Departmental reviews.

A GUIDE TO DETERMINING THE OPTIMUM GRADATION OF CONCRETE AGGREGATES

The Engineering Research and Development Bureau encouraged and facilitated a partnering effort between the members of RPI Chemical Engineering Department and Albany area concrete producers to develop a more durable and cost effective bridge deck concrete mix. This work is an extension of a SHRP research product and will contribute to the Department goal of more durable bridge decks.

ROUTE 17, REGION 6, TEMPORARY PORTLAND CEMENT CONCRETE PAVEMENT REPAIRS

Loss of load transfer between pavement slabs on Route 17 created a severe joint faulting problem which resulted in a poor ride. Insufficient funds were available to rehabilitate the pavement in the short term. Materials Bureau engineers proposed temporary joint faulting pavement repair techniques to address the problem. Working closely with the Region 6 Design Group, a repair technique utilizing micro-surfacing was selected. Specifications and procedures were developed to construct the repairs beginning in 1994.

FIRST NYSDOT METRIC TRAINING

The Engineering Research and Development Bureau staff developed, organized and conducted NYSDOT's first metric training courses. In mid-September 1993, 50 employees from the Technical Services Division participated in the training sessions. Human Resource Development Bureau staff also attended these sessions, and consulted and used the Bureau's manual in the development of Department-wide metric training.

GEOGRID REINFORCED EARTH SOIL SLOPES

Severe ground water conditions coupled with oversteepened embankment slopes caused two sections of Rte. 174 in Region 3 to fail. The conventional treatment would have been to reconstruct the slopes to an inclination of 1V on 2H and provide internal drainage. Because of a historic mill race located at the toe of slope, flattening could not be accomplished. A wall system would have worked but would have been expensive. Instead, it was decided to consider the use of a Geogrid Reinforced Earth Soil Slope (GRESS) System. The GRESS System consists of geogrid material arranged in horizontal planes in the backfill to resist outward movement of the reinforced soil mass. This mechanically stabilized earth slope system would allow slopes to be constructed to steeper inclinations (typically 1V on 1H).

Compared to a concrete wall option the GRESS System is economically more attractive. This project, now under contract is the first use of this method in NYSDOT. It is expected that geosynthetic reinforced soil slopes will be used more often as our experience with them increases.

COLD IN-PLACE PAVEMENT RECYCLING

Materials Bureau engineers worked with the Highway Maintenance Division and the liquid asphalt industry to develop procedures and Office of General Services specifications for "turn-key" cold in-place pavement recycling projects. Under these specifications, the Highway Maintenance Resident Engineer selects a section of pavement that fits the criteria and the contractor develops the mix design and constructs the pavement. Several projects were constructed successfully in 1993 and the Resident Engineer provided maintenance and protection of traffic.

INFORMATION MANAGEMENT FOR RESEARCH AND DEVELOPMENT

The Engineering Research and Development Bureau is developing a national resource document which identifies, classifies and determine the accessibility of relevant information sources concerning past, on-going, and planned highway research activities. The information contained in this will benefit the highway research community.

The study is also exploring alternative models for developing a coordinated national highway research database. The goal is to identify a standard mechanism through which researchers can have comprehensive, simple, affordable, and timely access to research information. The results of the study including the resource document will be published in June 1994. One session of the AASHTO Research Advisory Committee meeting to be held in Vail, Colorado, July 19, will be devoted to this topic. It is expected that this study will draw attention to this complicated issue and possibly help initiate a national effort in this direction.

STRATEGIC OUTLOOK AND PLAN FOR THE TECHNICAL SERVICES DIVISION

A strategic plan for work to be accomplished by the Technical Services Division must be developed within the context of emerging technologies, organization philosophy, human resource needs, refinements in mission, effective management and service to our customers.

At this time in the history of civil engineering, we are on the brink of revolutionary changes in the way we design highway pavements and formulate pavement materials.

Since ancient times, the design of both asphalt and concrete highway pavements has been an empirical process, that is, one that relied on experience and observation rather than the practical application of science, which defines the practice of engineering. If we are to apply engineering principles to total pavement design, we must develop and adopt a mechanistic - empirical approach. This can be accomplished, using resident expertise, within the Division, to combine both empirical and mechanistic methods into a single coordinated pavement design protocol, for new, reconstructed and rehabilitated pavements.

The history of asphalt pavement mixtures is shorter but very similar to that of pavement design. For nearly a century, asphalt binders could only be graded according to their workability, handling and safety characteristics. There was no measurable link between the binder grades used and their performance. The advent of SHRP's Superpave system gives materials engineers the tools and specifications to determine which binder will work best in a given set of circumstances. We must begin to put these new binders to work to improve the performance and durability of our pavement systems.

These efforts are the necessary first steps on a journey which, when completed, will include the combination of engineered pavement structures with Superpave binder and mixture technology. The result will be pavements that exhibit predictable, durable, cost effective performance in support of predicted traffic loadings and environmental factors over long periods of time.

NYSDOT, like all other state DOT's, is required by federal mandate to convert its capital construction program to the metric system by 1996. The Division is responsible for both Departmental coordination of the conversion and is responsible for a major part of the actual conversion. This fiscal year might well be called the year of metrication in NYSDOT. To meet the federal mandate, this year the standard specifications, standard sheets, and all supporting policy and manuals must be metricated. As in the remainder of the Department, metrication will have a high priority in the Division. Given the relationship between metrication and our ability to produce the capital program in 1996 and beyond, other work may be delayed if necessary to assure the accomplishment of this mandated conversion.

Within the transportation capital construction industry, the respective responsibilities of suppliers, contractors and owners is changing. Owners are beginning to insist that producers accept the responsibility for the quality control (QC) of that which they produce while redefining the role of the owner to one of quality assurance (QA). The application of QC/QA specifications is intended to provide for more effective use of resources and ensure high quality products within a framework of clearly defined responsibilities.

Beginning in 1992, we committed to a three year effort to convert the production of hot mix asphalt and portland cement concrete to a system which defines QC/QA responsibilities in accord

with the noted philosophy. We will advance this fundamental change to its expected completion by the end of 1995, with implementation in the 1996 construction season.

In an expansion of this philosophy, we have recently established a joint industry-DOT task force to explore the means to implement a QC/QA process for the control of granular materials produced for incorporation in capital projects.

Within NYSDOT there is a continuing trend toward decentralization of decision making from the Central Office to the Regions. This trend leaves to the Central Office the appropriate responsibility for the development of policy and processes and supporting quality assurance procedures. Last year we developed a procedure to assure the quality of Regional Materials Laboratory performance. This year we will undertake synthesizing existing or improved QA procedures for the Regional Soils Laboratories.

In our Subsurface Exploration program, the Soil Mechanics Bureau and the Regions have a longstanding concern for the proper development, retention, and compensation of the drilling crews. In response to this need, the Division, in cooperation with several Regions, will examine the issue, determine the appropriate response and take the necessary action to effect a resolution.

The Division's research and consultation program provided today is dramatically different from that of a few years ago. Its role and capabilities continue to evolve based on its growing maturity, new opportunities, and management direction.

Several years ago the Engineering Research and Development Bureau's personnel and operating practices were modified in order to improve its capability and performance in meeting the expectations of its mission. The primary change to the organization was an alteration in the title structure to ensure that highly qualified and motivated staff would be available to conduct research and consultation. In addition, support functions, such as the library and statistical services were put in place. Also, a new process to identify and select the research program was implemented.

More recently, the means to conduct external contract research has become available. This capability provides the Department with the opportunity to accomplish research which cannot be conducted in-house because we don't have either the expertise or the resources. It also opens the door to the establishment of a long term partnered relationship with the university system, a practice common to many DOT's but not to NYSDOT.

These opportunities bring with them the possibility for an expansion of the research mission beyond its present limitation of engineering. Additionally, the FHWA which administers our federally funded research program, is expected to alter its oversight procedures to allow for programmatic approval rather than individual project approval, a form of certification acceptance.

In recognition of these evolutionary changes and new opportunities, we need to re-examine and update the Engineering Research and Development Bureau's Policy and Procedures Manual which was last done in 1988.

The Division's institutional training will continue to be a priority. An example of the scope of this activity is the amount of training, both internal and external that took place last year. Internally, almost 1,800 staff received training, which averages more than 6 different types of

training per person in the Division. Externally 3,553 people from other Bureaus, Divisions and Regions received training by Division staff. We expect this level of activity to continue. The training coordinator in each of the Bureaus will communicate with the new Office of Engineering Training Coordinator to stay current and take advantage of opportunities such as our planned inauguration of formal "Quality through Participation."

Finally, in order to manage an organization as diverse and comprehensive as the Technical Services Division, its leaders must rely on performance measures essential to the successful delivery of its mission. Our managers need to reflect on those issues that are of true importance in support of our performance. We need to review the measurement tools now in place, modify them if necessary and add new ones that are found to be useful.

SUMMARY

The work done in the Technical Services Division is important work. Some of which affects development and implementation of innovative technology in the engineering profession at the national level. Every employee is important and is valued for the contribution each makes to our joint success. We are proud of our people and their accomplishments. We look forward to the challenges that face the Division and the contributions we can make to the success of NYSDOT.

II. GOALS

A. 94-95 Goals

Seven new operational goals have been identified, adding this to the long term QC/QA goal which continues, makes a total of eight operational goals.

The goals are listed below by name with a detailed Goal Statement in Appendix 1.

1. Asphalt and Concrete QC/QA
2. Superpave Implementation (Binder)
3. Development of a Rehabilitated Pavement Design Manual and Implementation of FWD
4. Development of a Five-Year Performance Monitoring Program for Both New and Reconstructed Pavements and Rehabilitated Pavements and Determine Resource Needs to Accomplish Same
5. Reclassification of Drilling Titles and Identifying Subsurface Exploration Issues Requiring Detailed Investigation
6. Quality Assurance of Regional Soil Laboratory Sampling and Testing Regional Subsurface Log Preparation
7. Update of the Engineering Research and Development Bureau's Policy and Procedures Manual
8. Review of Performance Measures

B. 93-94 Goals

The Division had five operational goals in its 1993-94 Operational Plan. These goals and their status are outlined below.

1. Asphalt & Concrete QC/QA

This long term goal continues the commitment made by the Department to change quality management for asphalt concrete and portland cement concrete from a "methods approach" to a Quality Control/Quality Assurance (QC/QA) approach. Under this new system contractors and suppliers are responsible for testing and controlling materials quality while the Department will concentrate on monitoring these activities for assurance purposes. This operational goal began in 1992 with completion expected at the close of 1995 and implementation beginning in the 1996 construction season.

Status: On schedule. The second years activities included four hot mix asphalt concrete projects using the QC/QA specifications in Regions 2, 5 and 8; the project experience as well as input from industry and the FHWA was used to refine the QC/QA specifications. A certification procedure and training was developed for asphalt concrete production plant inspectors. Future plans are to introduce the QC/QA approach to all Regions using the experience of an actual project as a vehicle.

In the portland cement concrete area, a QC/QA specification was developed with Regional and industry input for concrete production plants. Experimental projects are planned this construction season in Regions 1, 3, and 5.

2. Programmatic Quality Assurance - Regional Materials Laboratories

There are regional materials laboratories and staff in every Region, except Region 11 which relies on a commercial laboratory. Regional staff test materials associated with asphalt concrete and portland cement concrete for Department projects. This goal evaluated each Regional laboratory for current resources, program testing level and testing accuracy.

Status: Complete. An optimum testing level was determined to establish future resources needs. Testing accuracy determination will be performed on an annual basis using control samples tested in conjunction with Central Office laboratories. A goal completion report documents these findings.

3. Programmatic Quality Assurance - Pavement Rehabilitation Treatment Selection Process

Regional staff perform project level pavement evaluation and rehabilitation treatment selections in accordance with Engineering Instruction 92-015 and Volumes I and II of the Pavement Rehabilitation Manual. This goal was undertaken to ensure that pavement evaluation and treatment selection reports are uniform and consistent throughout the state.

Status: Complete. A procedure and standards were developed to test Regional pavement evaluation and treatment selection reports on a biennial

basis, using a field review by Central Office Materials Bureau Engineers. The procedure and standards are documented in the goal completion report.

4. Corrosion of Steel Culverts

This goal was initiated following the Route 481 steel culvert failure, which indicated that the Department's inspection procedures and evaluation efforts do not always identify the state of corrosion and its associated remaining service life. An evaluation of the existing design, inventory and inspection processes was undertaken to assess the potential for improving service life prediction.

Status: Complete. A goal completion report documents findings and results of a statewide interview process.

5. Implementation of Strategic Highway Research Program Products

SHRP products have been and are being developed. Fifteen products are completed and implementable with over one hundred more products expected. This goal established formal roles, responsibilities and schedules for the products evaluation. In this way the Department is ensured that all appropriate products are implemented.

Status: Complete. An implementation plan, committee and reporting mechanism has been established. Activities and the mechanism are documented in the goal completion report.

APPENDIX 1 - IMPROVEMENT GOALS

1. Asphalt and Concrete QC/QA

2. Superpave Implementation (Binder)

3. Development of a Rehabilitated Pavement Design Manual and Implementation of FWD

4. Development of a Five-Year Performance Monitoring Program for Both New and Reconstructed Pavements and Rehabilitated Pavements and Determine Resource Needs to Accomplish Same

5. Reclassification of Drilling Titles and Identifying Subsurface Exploration Issues Requiring Detailed Investigation

6. Quality Assurance of Regional Soil Laboratory Sampling and Testing Regional Subsurface Log Preparation

7. Develop ER&DB Policies and Procedures

8. Review of Performance Measures

Technical Services Division
GOAL STATEMENT

Goal Name: #94-1 Asphalt and Concrete QC/QA

As Is: The Department's quality assurance procedures require full time resident plant inspection, sampling and testing during the production of hot mix asphalt (HMA) and portland cement concrete (PCC). These procedures provide data for the control of the production operation as well as the basis for material acceptance.

Desired State: The contractor performs quality control (QC) sampling, testing and inspection while the Department performs quality assurance (QA) sampling, testing and inspection.

Specific Goal for SFY 94-95: Continue to work on the asphalt and concrete QC/QA three year goal started in SFY 92-93. This goal is for the development and implementation of a contractor QC and Department QA acceptance system for HMA and PCC by the start of the 1996 construction season.

Team Leader: Thomas Wohlscheid

Team: David Bernard (MB), Paul Ducharme (MB), Jack Sprague (R2), Les Ackerman (R8), Pete Melas (R1), Frank Lipinski (R11), and Rick Gervel (R3).

Rationale: The Department made a commitment in 1991 to change the quality assurance program for HMA and PCC from a "methods approach" to a "QC/QA" approach. The reasons for the change are to (1) improve or maintain product quality, (2) establish clear lines of responsibility between the contractor and the Department for product quality, and (3) seek operating cost reductions.

Under the new system, the contractor and supplier will be responsible for the mix design, sampling, testing and controlling the quality of the mixture through placement (QC). The Department will monitor these activities and perform testing for acceptance (QA). Payment will be based upon the percentage of material which is within the specification limits. This percentage will be determined statistically. Constituent materials will be Department approved as in the past.

Technical Services Division
GOAL STATEMENT

Goal Name: #94-2 Superpave Implementation (Binder)

As Is: AASHTO has recently published provisional Standard Specifications and test methods for performance graded asphalt binder. New York at present uses viscosity graded asphalt binder. The Materials Bureau has no experience using performance graded asphalt binder.

Desired State: Asphalt binders used by New York will be performance graded.

Specific Goal for SFY 94-95: By March 31, 1995 become proficient in performance grade binder testing and develop a plan to implement AASHTO performance grade binder specifications statewide.

Team Leader: William Koniowka

Team: Ron Sines
Jeff Groff
Makbul Hossain

Rationale: The AASHTO Provisional Standard Specifications and Test Methods for Performance Graded Asphalt Binder are a product of SHRP research. The specifications and test methods along with yet to be published specifications and test methods for bituminous mixes make up SHRP's SUPERPAVE program which will produce pavements designed to meet performance criteria based on properties of the binder and mix which actually contribute to the successful performance or failure of pavements. It is expected that SUPERPAVE will be adopted nationwide by the year 2000.

Technical Services Division
GOAL STATEMENT

Goal Name: #94-3 Development of a Rehabilitated Pavement Design Manual and Implementation of FWD.

As Is: Volume 1, Pavement Evaluation and Volume II, Treatment Selection of The Pavement Rehabilitation Manual, prepared by the Materials Bureau and last revised on February 1992 and May 1993, respectively, are our procedural manuals for evaluating the conditions of existing pavements and utilizing this information to form the basis for making decisions on rehabilitation alternatives taking into consideration expected service life and life-cycle cost analyses. Treatment selections are based on limited past experience with traffic volumes up to 35,000 AADT and 5 percent trucks.

Desired State: A rational method of determining pavement overlay thickness treatment selection based on an evaluation of the pavement structural capacity and future truck traffic over the desired service life.

Team Leader: Raymond L. Gemme

Team: Robert Burnett, Chris Nebral, Bill Snyder, Bill Cuerdon, Wes Yang, Julian Bendaña, Dave Fifield, Makbul Hossain, Carol Hennessy, Dick Obuchowski

Specific Goal for SFY 94-95 and SFY 95-96: Develop a method of designing overlay thicknesses for both rigid and flexible pavements using the AASHTO overlay design procedure or a mechanistic-empirical design procedure. It is expected that the Falling Weight Deflectometer (FWD) will be used to determine the pavement's structural capacity by providing layer moduli, based on deflection data. Develop a detailed plan by September 1, 1994. Calibrate and implement FWD as a design tool, if applicable, by May 1, 1995. Produce a final rehabilitation pavement overlay thickness design manual for implementation by March 31, 1996, considering in-situ pavement recycling and improvement opportunities.

Rationale: The quality of decision making concerning the need to rehabilitate or reconstruct our existing pavement systems is highly dependent on our ability to analyze their existing structural capacities and future capacities under different rehabilitation treatments. This design ability, along with prudent life-cycle cost analyses, will form the building blocks for innovative thinking (rational approach) concerning the effects of improved future materials and construction practices in creating higher quality pavement structures.

With a rational and well-calibrated overlay thickness design procedure, engineers can predict service lives more accurately. This will not only result in more accurate project-level life-cycle economic analysis, but also more accurate network-level capital programming.

Technical Services Division
GOAL STATEMENT

Goal Name: #94-4 Development of a Five-Year Performance Monitoring Program for Both New and Reconstructed Pavements and Rehabilitated Pavements and Determine Resource Needs to Accomplish Same.

As Is: New York State's Thickness Design Manual For New and Reconstructed Pavements became policy on October 14, 1993. In addition, a concurrent Technical Services Division Goal Statement identified for the next two fiscal years is to produce an overlay thickness design manual for rehabilitated pavements by March 31, 1996. There is presently no plan in motion to monitor these pavement structures to determine their long-term performance.

Desired State: Create a database of pavement performance monitoring information from which to draw from to provide for continuous improvement of our pavement structures.

Team Leader: Raymond L. Gemme

Team: Robert Burnett, Chris Nebral, Ed Moody, Bill Snyder, Bill Cuerdon, Wes Yang, Julian Bendaña, Makbul Hossain, Dave Fifield, Dick Obuchowski, Ed Denehy.

Specific Goal for SFY 94-95: Develop and implement a five-year plan to monitor the performance of pavement structures for both new and reconstructed pavements and rehabilitated pavements and estimate resource needs to implement the plan by March 31, 1995.

Rationale: Performance feedback of future pavements including, but not limited to, data from Falling Weight Deflectometer, Weigh-In-Motion station, pavement condition surveys, subsurface drainage systems, materials and construction quality practices surveys are necessary to obtain a database of information to verify service life, life-cycle cost and traffic forecasting predictions.

This database of information will create the tools necessary for continuous improvement of our pavement structures and more accurate network-level capital programming.

Resource needs to fully implement the five-year pavement performance monitoring program will be required to determine future budget allocations.

Technical Services Division
GOAL STATEMENT

Goal Name: #94-5 Reclassification of Drilling Titles and Identifying Subsurface Exploration Issues Requiring Detailed Investigation.

As Is: The existing job descriptions for the Drilling Title Series have not been updated since the late 1960's. They do not accurately reflect recent advances in drilling technology and the type of duties that are necessary to perform drilling operations in today's environment. The Series does not provide an integrated career ladder via a Trainee Program like the pattern for the Bridge Title Series. The Bureau has been requested by Civil Service to update the series to their current format and provide detailed information on how the Traineeship Program would be implemented.

Desired State: Create a revised Drilling Title Series that accurately describes the duties and performance measures for drilling operations in New York State. The Series should also address the issues of how entry level laborers would progress through the Series via a Traineeship Program and must conform to the format specified by Classification and Compensation. Once the Series is updated Civil Service can evaluate our drilling operations to see that the work skills and responsibilities for each title are commensurate with the grade level.

Team Leader: John Reagan

Team: Phil Walton, Ed Moody, Representatives from Regional Soils Sections, particularly Richard Kiehle and Joe LiBritz, Selected personnel from the existing Drilling Titles, Tony Minnitti and Ginny Jepson, Personnel Bureau.

Specific Goal for SFY 94-95:

By October 1, 1994

Establish a list of duties performed by each title and revise the Drill Rig Operator and Assistant Drill Rig Operator titles to the classification format standard specified by Civil Service; prepare a Traineeship Program that incorporates the skill development that is needed for a laborer to progress through the career ladder.

From October 1, 1994 to March 31, 1995

Identify and evaluate subsurface exploration issues that require detailed investigation.

Rationale: The quality of geotechnical engineering designs is predicated on obtaining quality subsurface information. It is imperative to maintain the quality of drilling personnel necessary to achieve this very important function. In addition to fulfilling the Civil Service Department request, it is anticipated that a Traineeship Program will help in retaining capable personnel and provide them with advancement opportunity.

Identifying Subsurface Exploration issues that require detailed investigation will lead to improved drilling operations.

Technical Services Division
GOAL STATEMENT

Goal Name: #94-6 Quality Assurance of Regional Soil Laboratory Sampling and Testing Regional Subsurface Log Preparation

As Is: The Regional Soil Laboratories obtain and perform testing on samples from subsurface explorations to design projects and on samples of granular materials to be incorporated in construction projects. Quality assurance of this work is conducted by the Soil Mechanics Bureau but is not currently documented as a unified formal program.

Desired State: By April 1, 1995, a formal program to provide a complete, scheduled and documented quality assurance program for the sampling and testing functions of the Regional Soil Laboratories: also a quality assurance program for Subsurface Exploration Logs.

Team Leader: Edward Moody

Team: John Remmers, Stephen Mabin, Paul Salchert, James Saxton, Frank Hogan

Specific Goal for SFY 94-95: Document the Quality Assurance System currently in use by the Soil Mechanics Bureau which evaluates all aspects of the sampling and testing conducted by the Regional Soil Laboratories and the quality assurance of subsurface exploration logs. Identify deficiencies in the existing QA systems and provide recommendations to be implemented subsequent to the completion of this goal.

Rationale: The quality of subsurface information and laboratory testing is critical to the quality of all geotechnical designs and construction material testing progressed for Department projects. Contractors and suppliers have the right to expect quality testing since the acceptance or rejection of their materials have serious economic consequences to them. Although quality assurance procedures are conducted now, establishing a unified formal process will ensure that this activity is carried out thoroughly and consistently. Records will then be available to demonstrate that the work is of high quality if any questions ever arise.

Technical Services Division
GOAL STATEMENT

Goal Name: #94-7 Develop ER&DB Polices and Procedures

As Is: ER&DB's role and responsibilities as the Department's engineering research provider are expected to be altered significantly in the near future. The Bureau first expects to be affected by an expansion of its mission to include transit, planning, and IVHS research. The Bureau envisions addressing this expanded role by increasing its contract research capability and by exploring the potential for a university partnering arrangement. Second, FHWA is expected to change its conduct and management of federal-aid research from project to program oversight. No policies and procedures exist which address these significant changes to the Bureau's role.

Desired State: To establish policies and procedures which address the expanding scope and breadth of the Department's research activities.

Team Leader: R. A. Valenti, Engineering Research and Development Bureau

Team: P. J. Mack, Technical Services Division
R. J. Perry, Engineering Research and Development Bureau
M. Frederick, Engineering Research and Development Bureau
W. Yang, Engineering Research and Development Bureau
R. Dunn, Federal Highway Administration

Specific Goal for SFY 94-95: To precisely determine the Bureau's expanded role with respect to the review and coordination of all research as described in the Department's vision statement. To explore the potential for a university partnering arrangement as one means to address the expanded role. To determine the impact of reduced FHWA involvement in the conduct and management of the federal-aid program as provided under final rule making. Then to develop and publish a Policy and Procedure Manual which incorporates these expected changes, by May 31, 1995.

Rationale: Since 1988, several changes have taken place which significantly impact the manner in which the Bureau functions. These changes include the development of an interactive process to identify and prioritize the Bureau's activities for inclusion in its annual work program, a change in the Bureau's organization and mission which emphasized engineering research and technology transfer in the areas of structures, materials and pavements, and the addition of a significant contract(outside) research program.

Other significant changes are expected in the near future. First, the Bureau expects its role will expand to include the review and coordination of all Department research as described in the Department's vision statement. Secondly, the Bureau is pursing a partnership with a consortium of colleges and universities for the effective conduct of its outside research program. Thirdly, an expected FHWA rule making will reduce their oversight responsibilities and result in changes to Bureau operations.

Policies and procedures need to be established which address the expanding scope and breadth of the Department's research activities. These policies and procedures can be documented in a manual which will serve to inform both Bureau staff and outsiders on the laws, rules, and regulations affecting its operation and function. The manual will also provide detailed documentation on policies and procedures which enable the Bureau to carry out its mission.

Technical Services Division
GOAL STATEMENT

Goal Name: #94-8 Review of Performance Measures

As Is: The Division and Bureau Managers use various performance measures in managing their operations.

Desired State: By April 1, 1995, ensure that only relevant, current measures continue to be used. As appropriate, new or modified measures are added.

Specific Goal for SFY 93-94: Review and document the existing performance measures in use in the Division and Bureaus, judge and recommend discarding those that are obsolete and recommend adding any new measures. Document findings in a report, implement new measures.

Team Leader: Richard Obuchowski

Team: Faizal Enu, Engineering Research and Development Bureau
Pratip Lahiri, Materials Bureau
Gary Robinson, Soil Mechanics Bureau

Rationale: Performance measures are an important tool for managers. Performance measures are used to ensure work programs are being accomplished, they are used to detect problems, and they are used to justify resources. Some of the existing measures original intent seems to have been lost over time. A current overview is in order.

APPENDIX 2

The Technical Services Division is in the process of reviewing its strengths, opportunities for improvement and external forces as part of the Operational Planning process, the following Internal Control plans have been developed and will be implemented.

TECHNICAL SERVICES DIVISION
INTERNAL CONTROL PLAN
(1ST YEAR 1994/95)

1. A. Bureau Director identifies/appoints a task group in each Bureau.

   B. Task group assigned responsibility for covering all sections in each Bureau (Section Heads may be most knowledgeable participant for task group)

   C. Bureau Directors provides an informational copy of task group list to Division Director by May 15.

2. A. Bureau Director provides each task group member with copies of "Operational Planning 1994-95-96...." and "Internal Controls".

   B. Bureau Directors and Task Group Members participate in Division-wide meeting chaired by Division Director.

3. A. Task Groups begin work

   B. Lists functions and operations in each Section in their Bureau.

   C. Bureau Directors submit informational copy of list to Division Director by October 15.

4. A. Task Group continues, identifies needed changes in each function/operation to reduce vulnerability using checklist.

   B. Functions/operations are categorized into strengths and weaknesses. Recommendations are made to Bureau Director to handle weaknesses.

   C. Bureau Director submits informational copy to Division Director by December 15.

5. A. Bureau Director with Task Group decides on future course of action for perceived weaknesses.

   B. Bureau Director begins steps to improve functions/operations. Action may be immediate or long term (e.g. OP Goal)

   C. Bureau Director provides a copy of list of action taken, recommended to Division Director by February 15, 1995.

   D. Bureau/Division Directors agree on action.

   E. Bureau Directors begin implementation of necessary actions.

TECHNICAL SERVICES DIVISION
INTERNAL CONTROL PLAN
(FUTURE YEARS POST 1994/95)

1. A. Bureau Director identifies/appoints a Task Group in each Bureau.

   B. Task group assigned responsibility for covering all sections in each Bureau.

   C. Bureau Director provides an informational copy of Task Group list to Division Director by May 15.

2. A. Bureau Director provides each Task Group member with current copy of Operational Planning instructions and Internal Controls publication.

   B. Bureau Director and Task Group members participate in Division-wide meeting chaired by Division Director.

3. A. Task Groups begin work

   B. Reviews past list of functions/operations for each section in their Bureau, adds or revises as necessary. Develops a new list.

   C. Bureau Director submits information copy of list to Division Director by October 15.

4. A. Task Groups review previous years recommendations and actions.

   B. Task Groups obtain feedback on actions.

   C. Using feedback, functions/operations are categorized into strengths and weaknesses. Reports are made to Bureau Director on effect of previous years recommendations. Recommendations are made to Bureau Director to handle weaknesses.

   D. Bureau Directors submit information copy to Division Director by December 15.

5. A. Bureau Director with Task Group decides on future course of action for perceived weaknesses.

   B. Bureau Director begins steps to improve functions/operations. Action may be immediate or long term (e.g. OP Goal)

   C. Bureau Director provides a copy of list of action taken, recommended to Division Director by February 15.

   D. Bureau/Division Directors agree on action.

   E. Bureau Directors begin implementation of necessary actions.

APPENDIX 3 - PROPOSED BUDGET FOR SFY 1995/96

Personal Service Needs

The Technical Services Division through the Soil Mechanics Bureau and Materials Bureau provides direct support of the Department's Capital Program. Foundation design for all structures and roadways is carried out by Soil Mechanics Engineers and Technicians. Quality assurance for all materials incorporated into Department projects is carried out by both Soil Mechanics and Materials Bureau Engineers, Technicians and Analysts who directly test materials and manage a materials quality assurance program.

The Engineering Research and Development bureau has expanded its capabilities in the past year. In addition to carrying out engineering research using its own personnel, the Bureau now has the capability and Federal State Planning and Research funding to manage a Contract Research program. University and private researchers will carry out Department selected contract research, which will be managed by Engineering Research and Development Bureau personnel.

In SFY 94/95 the Division's authorized target was 310. This significant increase over this last fiscal year has provided relief from a personnel deficit which has built up over time due to increased responsibilities and the increased capital program. For SFY 95/96, we see only modest requests for additional target for people to support the relatively modest increase in the Capital Program and to staff new program responsibilities such as the new pavement analyzer equipment.

Non-Personal Service Needs

The Materials and Soil Mechanics Bureau through their laboratories and Regional Materials and Soil laboratories test materials that are incorporated into Department projects. These activities both, Central Office and Regional are supported by the supplies and materials allocation.

Based on past years expenditures, the increase of the capital program and estimating future needs, we are contemplating an initiative for a substantial increase to supplies and materials base budget. To support this initiative both Bureaus are currently analyzing their needs by "zero basing" to justify funding for this category.

Other non-personal service allocations are at generally acceptable levels to support current activities. Future activities such as operating and calibrating the pavement analyzer equipment and contract research support are expected to generate modest requests for increases in the base budget.

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